

Technical Assessment of Utilizing Electrical Variable Transmission Systems in Hybrid Electric Vehicles

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Abstract : The Electrical Variable Transmission (EVT), an electromechanical device, can be considered as an alternative solution to the conventional transmission system utilized in Hybrid Electric Vehicles (HEVs). This study present comparisons in terms of fuel consumption, power split, and state of charge (SoC) of an HEV containing an EVT to a conventional parallel topology and a series topology. To this end, corresponding simulations of these topologies are all performed in presence of control strategies enabling battery charge-sustaining and efficient power split. The power flow through the components of the vehicle are attained, and fuel consumption results of the considered cases are compared. The investigation of the results indicates utilizing EVT can provide significant added values in HEV configurations. The outcome of the current research paves its path for implementation of design optimization approaches on such systems in further research directions.

Keywords : Electrical Variable Transmission (EVT), Hybrid Electric Vehicle (HEV), parallel, series, modeling

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